Council Agenda #7A
Meeting of February 26, 2008

Staff Report

DISCUSSION AND DIRECTION REGARDING PROPOSED STREETLIGHTS FOR THE OLD COUNTY ROAD PROJECT AND THE CITY STANDARD FOR STREETLIGHTS

Honorable Mayor and Council Members:

Summary
This report describes streetlight standards (poles) and fixtures for consideration on Old County Road and elsewhere in the City on future projects. The purpose of the presentation is two-fold. First, to provide the City Council with information regarding attractive streetlighting options for Arterial Roadways, such as Ralston Avenue, El Camino Real, and Old County Road where roadway oriented lighting is desired. The second issue is to provide the Council with information on decorative streetlight options for use in our economic development areas where shorter, more decorative streetlights may be desired.

Samples of certain streetlight standards and fixtures will be available to view outside City Hall.

Background
The proposed approach is to utilize several types of compatible streetlights, throughout the City. This approach is a practical one that provides a unified theme between areas with different lighting needs, but without trying to have a one size fits all solution. It allows our community to gain desired aesthetics through the use of shorter and more decorative lights at focal points or locations with heavy pedestrian traffic. These more decorative lights would be suitable for use within the City economic development target sites. Taller and engineered lights are needed for signalized intersections and along Arterial roadways to effectively meet best practice design guidelines for streetlighting.

The approach is also consistent with that adopted in the Boulevard Policy for the Downtown Specific Plan, where two types of streetlights were recommended for use.

Arterial and Major Collector Streetlighting
Old County Road is highlighted as the City has an upcoming project for undergrounding that will remove the existing power poles that streetlights are attached to. New streetlights will need to be installed.

Currently, Old County Road underground conduit installation and overlay of Old County Road is planned for construction beginning shortly. The number and type of streetlights need to be determined as a part of the conduit design. The streetlight fixture type and mounting height needs to be finalized by the middle of March to finalize the design. Installation of the streetlights and additional undergrounding work will occur at a later date, when scheduled by PG&E.

A preliminary layout has been put together assuming a Holophand Esplanade "Teardrop (6'Mast Arm)" type fixture. (See Attachment) Considerations in use of this fixture included compatibility with a longer mast arm, ease of maintenance, availability of the product, and lighting optics suitable for roadway uses. This includes cutoff type optics and a pendant mounting design that reduces the amount of up-lighting and focuses light on the road without creating bright spots. Arterial roadways typically have fixtures mounted at thirty foot height. This fixture is suitable for mounting at that height. The fixture is also one that appears to be compatible with other fixtures selected for use by the City in the downtown area. This is an attractive and decorative fixture, but one that is easy to maintain and suitable for common use for roadway lighting purposes.

This design effort evaluated lighting levels and uniformity using the Illuminating Engineering Society of North America's roadway lighting guide guidelines, with a recommended Illuminance criteria lighting level of 0.5 foot candles and a uniformity ratio of 4:1. This design guideline is a best practices design guideline used by many communities that do not have an adopted standard when they design new roadway and intersection projects. The City of Belmont does not have an adopted standard.

One factor influencing spacing for the fixture is pole height. The design resulted in streetlights being spaced at 180 foot intervals. If the fixture mounting height is lower, the number of streetlights to be installed needs to be increased to achieve the same lighting level. For example, if the pole height was decreased from 30 feet to 20 feet, the spacing would decrease from approximately 180 feet between streetlights to 120 feet. The number of streetlights needed on any stretch of roadway would increase by around 30 percent.

Another factor is fixture type. With the exception of the Acorn fixture, all the fixtures evaluated in this report have similar spacing requirements. Twice as many Acorn fixtures would have to be installed to maintain the same lighting level if Acorn fixtures were ultimately to be used.

Old County Road Undergrounding and Overlay Project

Completion of the streetlight design, and selection of the streetlight fixture and mounting height for Arterial Roadways, is needed to accommodate the Old County Road undergrounding project.

In 2003 the City of Belmont formed an Underground Utility District to underground the overhead lines on Old County Road. Pacific Gas and Electric Company (PG&E) is performing the design and construction of the project using City of Belmont Rule 20A funds.

The City secured a grant to pave Old County Road from Ralston Avenue to the County line, 1100 feet south of Ralston Avenue. Redevelopment is providing matching funds. The project has a deadline for use of the grant funds and PG&E has agreed to move up a portion of the undergrounding work and do the work in phases such that trenching in the portion of Old County Road to be paved may be completed before the roadway is paved. The City paving project will include installation of conduit for the streetlight which requires the streetlight selection for Old County Road be finalized by the middle of March so the design may be completed by the project deadline.

The remainder of the work will be completed at a future date, which has not yet been established by PG&E. Future work includes installation of the remaining conduit, pulling wires into the entire length of the conduit, making new streetlight installation and residential connections, and the removal of existing power poles.

Streetlights

In 2006, the Infrastructure Committee met regarding streetlights suggested for use on the Old County Road project and on other future City projects. The discussion included parameters that were considered desirable for consideration in the selection of streetlights.

The discussion was general, and further discussion with the City Council is desired. Some preferences and parameters were suggested for consideration. These include:

Style:	Classic
Finish:	Metal
Color:	Hunter or Forest Green
Mast Arm:	yes
Standard:	Tapered
Base:	Defined, substantial, and articulated
Options:	Single or Double fixture
	Banners or Flower Basket Holders
Maintenance:	Cost, Durability, ease of maintenance
Optics:	Environmental lighting of the sky

Several fixtures and poles were selected, to determine how they measure up against the considerations. These include the Sun Valley lighting details, numbered CS 4954 “Teardrop (2’ mast arm)” type, CS 4953 “LCGS” type, and CS 4952 “Shorewood” type streetlight. Copies of those details are attachment A to the staff report. The mobile showroom has the fixture and sample standards in the different colors available for review.

Public Works Staff was asked to consider wood poles, consistent with existing wood poles in the City of Belmont. Wooden poles may not be as durable as aluminum or steel poles, but they can be treated to extend their life. Wooden poles are treated with a 6% pentachlorophenol borne in a

light hydrocarbon solvent to help preserve the wood. A non-chemical alternative is to install cedar poles. Cedar poles should not be directly buried, but placed in a bracket that can be bolted to a concrete base instead. Copies of several alternative details illustrating possible wood pole streetlights are attached to the report as Attachment A. The fixtures illustrated are similar to the Sun Valley light fixtures and were not evaluated separately. Samples of a treated and untreated cedar pole are available for review, along with the base. The base on display has a section suitable for a twenty foot tall pole. For a thirty foot tall pole height the pole section would increase to 6" x 6". There are existing streetlights in Belmont that are on wooden poles that may also be observed along Ralston Avenue and in streets surrounding City Hall.

There are alternative manufactured poles that have the look of wood. These include composite materials made of fiberglass, steel core with a hardwood profile, or concrete. If additional information is desired on these options it may be presented a future meeting.

Old County Road is within the Downtown Specific Plan Area, which recommends an Acorn fixture. The Acorn fixture is similar to the Sun Valley Lighting LAE1 fixture on display in the mobile showroom and installed at the Safeway located on El Camino Real, one block south of Ralston Avenue and the adjoining area. A copy of a portion of the detail from the Downtown Streetscape Design Guidelines developed in July 1994, which included a copy of the fixture detail, is attached to the staff report with Attachment A as the "Acorn" type. Additional details from the Downtown Specific Plan Design Guidelines are attached to the staff report as Attachment B.

Discussion

On new construction projects or in communities where there is an adopted standard for lighting level and uniformity, streetlights are located with the goal of providing a desired level of lighting and uniformity. The level of lighting typically is measured in foot candles as a measure of the candle power produced by the light. The uniformity is a measure of whether the roadway has bright and dark spots with a lower ratio indicating a more uniform pattern (so for example, a 4:1 ratio would indicated a more uniform pattern than a 6:1 ratio).

Lighting can be designed with different patterns, or shape of the light on the roadway. In general, the range is from a lighting pattern that is narrow to broad. Some patterns are distributed narrowly, and would be used on a narrow bicycle path. A broad pattern is a circular pattern that is ideal for parking and area lighting. The lighting patterns in between are generally recommended for roadway lighting and can be used without alteration of the light pattern.

The fixtures featured all have roadway type pattern lighting available and can be used for roadway purposes. The lighting from the Acorn fixture is more diffuse as discussed earlier. If the Acorn fixture was to be used on Arterial roadways twice as many streetlights would need to be installed

An environmental issue with outdoor lighting is light pollution. To minimize light that shines up from the streetlight and to help preserve the night environment, fixtures can be designed with cutoff optics. Many modern lights have sophisticated optics, and manufacturers update their fixture designs to improve the optics on an ongoing basis. Cutoff fixtures range from full cutoff to semi cutoff. With a full cutoff fixture, there is no light directed at or above the horizontal plane and there is little or no light at angles typically associated with glare. With a semi cutoff fixture there is slightly more light at the horizontal plane than in the cutoff distribution with less than 5% of the lamp lumens above the horizontal plane.

House shielding may be added next to the lamp to direct light away from the house side of the light when necessary to block light away from adjoining residences. Internal shielding is available with some fixtures. On older fixtures or where the fixture has been retro-fitted, it is common to see external shielding. The shielding will affect the appearance of the fixture. One advantage of a mast arm is that it reduces the amount of light cast away from the street side of the fixture. This is desirable adjoining residences.

The tear drop fixture is the easiest to maintain, and the removal and replacement can be performed quickly. This reduces maintenance cost. The remaining fixtures have similar maintenance cost though the Shorewood fixture is the heaviest (and the most expensive fixture to replace) and this would contribute to increased maintenance cost.

The wooden pole is the less expensive type of pole to buy and install and is available in a wide range of heights. The wooden pole sample that was provided is for the shorter decorative pole seen throughout the City. Taller poles would have a six-inch section across. The life of a wooden pole is considered to be less than that of a metal pole. City of Belmont experience with wood poles, in terms of their maintenance has not been completely positive. Over time the wood deteriorates, and the strength is called into question. After some time, flag poles cannot be connected to the wooden pole and mast arms are not considered as reliable. Wood poles also tend to break when struck by vehicles and may be scratched.

Steel poles are typically either galvanized steel or galvanized steel with a color coating. For shorter poles, aluminum is a more expensive but good option. The color coating is applied as either a baked on enamel coating or powder coating.

The baked-on enamel is a baked on application of paint. Historically, communities would buy metal poles and have an ongoing program to paint the poles to maintain the color. This has a high maintenance cost. In communities where there are many existing painted poles and an existing program to paint poles, baked-on enamel might be used as scratches in the baked on enamel can be painted over. Powder coating is more common in communities that do not already have a lot

of painted poles as it does not require painting. Manufacturers continue to provide updated finishes. A newer type of coating is anodized metal. This gives a deep metallic look that does not show scratches. Metal poles last for many years with little maintenance.

A comparison table is attached to the staff report that generally evaluates each style of fixture and pole against some of the considerations for streetlighting described above.

General Plan/Vision Statement

The Downtown Specific Plan, amended July 25, 1995, recommends the following for the main boulevards in the downtown area, Ralston Avenue and El Camino Real.

Downtown Boulevard Policy. *El Camino Real from Middle Avenue to Broadway and Ralston Avenue from Hiller Avenue to Sixth Avenue shall be developed as the visually prominent, evergreen boulevards of the downtown as roadway improvements are phased over time.*

Design Guidelines. *The intent is to achieve a continuous wall of evergreen street trees along property frontages, and a landscape median where possible and as required for traffic control. The boulevard cross section elevation illustrated below demonstrate the ultimate street right-of-way treatment which should be achieved through development of El Camino Real and Ralston Avenue over time in conjunction with traffic improvement upgrades. The following boulevard design guidelines set forth the design intent for right-of-way treatment, street trees and plant materials, and streetlighting.*

Streetlighting. *Streetlighting at the sidewalk should be a distinctive fixture for the downtown district compatible with the architectural treatment theme. The fixture may have an old-fashioned character such as the streetlights along Market Street in San Francisco (comparable fixtures include the National Series by Union Metal or those by Visco). Within the El Camino Real median, tall dual cobra-head fixtures (PG&E) standard) mounted on signal poles at appropriate intervals to meet Caltrans standards should light both sides of the roadways. All light poles should be painted a deep gun-metal blue.*

Architectural Goals and Objectives. *A distinct architectural theme for downtown and commercial areas along the El Camino/Ralston axis should be based on one coordinated design theme to distinguish Belmont from surrounding communities and create a sense of a unified downtown area. The architectural style should be based upon use of the historic forms and build on the existing inventory of buildings that are either historic buildings or new buildings with historic elements.*

The Downtown Specific Plan, amendment to the Architectural Theme and Treatment Policy

dated July 6, 1999, recommends the following for the entire commercial area, including Old County road:

In 1997, the Downtown Task Force recommended a cohesive architectural design theme for the commercial areas downtown and along El Camino, Old County Road, and Ralston corridors. The Task Force found that the prior use of multiple theme zones did not support creating a unified sense of place for the main commercial part of Belmont nor did it help define an area that could be considered Downtown Belmont. The Task Force recommended utilization of one unified theme from City border to City border along the El Camino, and the use of a common architectural palette would help define Belmont's commercial area as unique from other cities and help define the limits of the downtown area."

Streetlighting Policy: All street and parking lot lighting standards shall conform to the City "Acorn" design, and shall include integrated, interior shields to avoid the spread of light skyward and direct light downward. Existing Acorn lighting should retrofit to this standard.

Downtown Streetscape Design Guidelines, Belmont CA, July 1994
A copy of a portion of the guidelines adopted by the Planning Commission on August 2, 1994 is attached to this report as Attachment B. The Planning Commission selected medium gloss black color, on October 4, 1994, for the street lamps and street furniture.

Use of fixtures other than the Acorn fixture in the Downtown Specific Plan area would require a text amendment to the Specific Plan.

Fiscal Impact
There is no fiscal impact as a result of this report.

Public Contact
The Council agenda was posted.

Discussion and Direction
Staff recommends that Council accept this informational report, and provide discussion and direction. The proposed fixture mounting height is 30 feet on Arterial Roadways and between 12 and 15 feet in the Economic Development Area for decorative lighting. A rating table for rating the presented options is attached to this report to aid the Council in evaluating the different Standard, bases, fixtures, and mast arms.

Alternatives
1. Take no action.
2. Refer back to staff for further information.

Attachments

A. Streetlight Details – Council only
   - Teardrop (6'mast arm)
   - Teardrop (2' mast arm)
   - LCGS
   - Shorewood
   - Acorn
   - Wood Poles – Options 1-3

B. Downtown Streetscape Design Guidelines – Council only
C. Comparison Table – Council only
D. Rating Table – Council only

Respectfully submitted,

Karen Borrmann, PE City Engineer	Raymond E. Davis III, PE PTOE Director of Public Works	Jack R. Crist City Manager

Staff Contact:
Karen Borrmann
650-595-7469
kborrmann@belmont.gov